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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/072,511	02/05/2002	Seok-Hyun Yun	005489.P001	2881

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Stephen M. De Klerk
BLAKELY, SOKOLOFF, TAYLOR & ZAFMAN LLP
Seventh Floor
12400 Wilshire Boulevard
Los Angeles, CA 90025-1026

EXAMINER
SUCHECKI, KRYSTYNA

ART UNIT	PAPER NUMBER
2882	

DATE MAILED: 08/13/2003

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No.	Applicant(s)	
	10/072,511	YUN ET AL.	
	Examiner	Art Unit	
	Krystyna Suchecki	2882	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☐ Responsive to communication(s) filed on _____ .

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-22* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1-6,8,10-12 and 16-21* is/are rejected.

7)☒ Claim(s) *2-4,6,7,9,11 and 14-22* is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☒ The drawing(s) filed on *05 February 2002* is/are: a)☐ accepted or b)☒ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

11)☐ The proposed drawing correction filed on _____ is: a)☐ approved b)☐ disapproved by the Examiner.

If approved, corrected drawings are required in reply to this Office action.

12)☐ The oath or declaration is objected to by the Examiner.

Priority under 35 U.S.C. §§ 119 and 120

13)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____ .

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

14)☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application).

a) ☐ The translation of the foreign language provisional application has been received.

15)☒ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121:

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☐ Information Disclosure Statement(s) (PTO-1449) Paper No(s) _____ .
4) ☐ Interview Summary (PTO-413) Paper No(s). _____ .
5) ☐ Notice of Informal Patent Application (PTO-152)
6) ☐ Other: .

DETAILED ACTION

Drawings

1. New corrected drawings are required in this application because Figure 3 has stray markings and numerical markings that are not clear. Other hand-drawn figures similarly contain unclear numerals and blurred depictions. Applicant is advised to employ the services of a competent patent draftsperson outside the Office, as the U.S. Patent and Trademark Office no longer prepares new drawings. The corrected drawings are required in reply to the Office action to avoid abandonment of the application. The requirement for corrected drawings will not be held in abeyance.

Claim Objections

2. Claims 2-4, 6-7, 9, 11 and 14-22 are objected to because of the following informalities:

3. Claims 2-4, 6-7, 9, 16, 21 and 22 have antecedent errors, wherein a previously un-introduced limitation is referenced as if already presented ("the flexural wave", "the flexural wave"., "the transducer", "the first and second sides of the fiber", "the flexural wave", "the mount", "the flexural wave", "the light" and both "the light" and "the first surface", respectively). For examination purposes, proper antecedent introduction will be assumed present.

4. Claim 9 is further objected to because no interpretation can be made for the last line "than above the fiber". For examination purposes, Examiner assumes the arrangement of Figure 4 was intended to have been recited.

5. Claim 11 is objected to for the last line's reference to "the wave", which should reference "the acoustic wave".

6. Claim 14 is objected to since it is not clear what is being claimed. If a parabolic surface, wherein the arm of the parabola extends towards the wave generator, is intended, some antecedent in the drawings or specification is needed. Since the phrase "next to" could be interpreted to mean "touching the fiber", the reference to above and below the fiber is distorted. The drawings show above and below portions being parallel to the direction in which the fiber extends, but the portions of the damper extending away from the fiber axis could be construed as above or below. Another solution would be to use not only a reference plane, but a means to express the direction of motion away from that plane, such as the clockwise and counterclockwise references in the specification. Without better directional reference, the angles have no clear meaning. For examination purposes, the arrangement of Figure 4 will be understood as intended.

7. Claim 15 is objected to for unclear wording. A clear understanding cannot be made of what is occurring with the reflections of the acoustic wave. The reflections are either additively canceling one another out by their back reflections (for which there is no antecedent in the drawings), or the back-reflected wave is canceling out the forward propagating acoustic wave. The later interpretation will be used for examination purposes.

8. Claim 17 should read "wherein two of the plurality of surfaces are first and second surfaces...", since there may be more than one damper, and, hence, all of the surfaces cannot be to the same damper.

9. Claim 18 should reference "a third surface", not "a third of the surfaces".

10. Claim 19 should reference "the first surface" not "a first of the surfaces".

11. Claim 20 should reference "the second surface" not " a second of the surfaces".

Appropriate correction is required.

Claim Rejections - 35 USC § 102

> (e) the invention was described in (1) an application for patent, published under section 122(b), by another filed in the United States before the invention by the applicant for patent or (2) a patent granted on an application for patent by another filed in the United States before the invention by the applicant for patent, except that an international application filed under the treaty defined in section 351(a) shall have the effects for purposes of this subsection of an application filed in the United States only if the international application designated the United States and was published under Article 21(2) of such treaty in the English language.

12. Claims 1-6, 8, 10-11 and 16-21 are rejected under 35 U.S.C. 102(e) as being anticipated by Kim (US 6,266,462).

13. Regarding Claim 1, Kim teaches an acousto-optic filter comprising: an optical fiber having an interaction length (Figure 4, item 36); a wave generator (Figure 11) coupled to the optical fiber and generating an acoustic wave in the optical fiber; and a damper (Figure 4, item 30) located on the optical fiber with the interaction length between the wave generator and the damper, the damper having a first surface which, as viewed in cross-section through the damper and fiber at right angles to a direction in which the fiber extends, covers a portion only of the optical fiber.

14. Regarding Claim 2, Kim teaches an acousto-optic filter wherein the acoustic wave is the flexural wave (Column 5).

15. Regarding Claim 3, Kim teaches an acousto-optic filter wherein the flexural wave has an amplitude in a y-direction ("microbends") and the first surface is at an acute angle relative to the y-direction (Figure 4, see upper side of slant on item 30).

16. Regarding Claim 4, Kim teaches an acousto-optic filter wherein the first surface is on a side of the damper facing the transducer (Figure 8, item 24).

17. Regarding Claim 5, Kim teaches an acousto-optic filter wherein the damper has a second surface on a side thereof opposing the tranducer which is slanted (see lower side of slant on item 30)

18. Regarding Claim 6, depending upon which side of the fiber is used for a first line of an angle with a vertex at point 34 of Figure 8, the side portion of the fiber not covered by the damper, or side the portion of the fiber covered by the damper, Kim teaches an acousto-optic filter wherein the second surface relative to the direction of travel of the wave is obtuse and acute on the first and second sides of the fiber, respectively (Figure 8).

19. Regarding Claim 8, since soft materials are generally understood to be porous, Kim teaches an acousto-optic filter wherein the damper is made of at least one of silicone and a porous material (Column 7).

20. Regarding Claim 10, Kim teaches an acousto-optic filter wherein light couples from one optical mode to another in the fiber (Column 2, lines 45-49).

21. Regarding Claim 11, Kim teaches an acousto-optic filter wherein the interaction length has a core through wwhich the light travels and a cladding into which the light couples due to the wave (Columns 2-3).

22. Regarding Claim 15, Kim teaches an acousto-optic filter comprising: an optical fiber (12) having an interaction length (36); a wave generator (Figure 11) coupled to the fiber and generating an acoustic wave in the optical fiber (Column 5); and one or more dampers (30 and Column 9, line 51- Column 10, line 25) defining a plurality of surfaces transverse to a direction in which the acoustic wave travels, wherein reflection of the acoustic wave by the surfaces back

towards the wave generator at least partially cancel one another out (Column 9, line 51- Column 10, line 25).

23. Regarding Claim 16, Kim teaches an acousto-optic filter wherein the acoustic wave causes the flexural wave (Column 5).

24. Regarding Claim 17, Kim teaches an acousto-optic filter wherein two of the plurality of surfaces are first and second surfaces of a first damper respectively facing toward and away from the transducer (30).

25. Regarding Claim 18, Kim teaches an acousto-optic filter wherein a third surface is on a second damper and faces towards the second surface (48).

26. Regarding Claim 19, Kim teaches an acousto-optic filter wherein at least the first surface is at an oblique angle relative to the direction in which the wave travels (Figure 4, see upper side of slant on item 30).

27. Regarding Claim 20, Kim teaches an acousto-optic filter wherein at least the second surface is at an oblique angle relative to the direction in which the flexural wave travels (Figure 4, see lower side of slant on item 30).

28. Regarding Claim 21, Kim teaches a method of filtering light comprising: transmitting light through an optical fiber (12); vibrating a first end of an interaction length of the fiber to generate an acoustic wave traveling through the interaction length (Column 5-6); and damping the transverse wave with a damper (30) at a second, opposing end of the interaction length, the damper having a first surface which is slanted so that the damper covers a portion only of the optical fiber as viewed in cross-section through the damper and the fiber at right angles to a direction in which the fiber extends.

Claim Rejections - 35 USC § 103

29. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

30. Claim 12 is rejected under 35 U.S.C. 103(a) as being unpatentable over Kim.

31. Regarding Claim 12, Kim teaches the damper (30) can be made of several materials in order to reduce reflection of incident waves (Column 7, lines 34-39), but does not explicitly teach the damper having a refractive index substantially close to the refractive index of a layer of the cladding.

32. Kim separately teaches several other materials for another damper in the system, which have been chosen based upon the material's suitability to perform the damping function and to reduce back reflections of incident waves (Column 7, lines 34-39 and Column 10, lines 23-25).

33. Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to use the damper material taught by Kim for a second damper in the system for the first damper of the system in order to create an acousto-optic filter wherein the damper has a refractive index substantially close to the refractive index of a layer of the cladding in order to reduce back reflections of incident waves (Column 7, lines 34-39 and Column 10, lines 23-25), especially since it has been held to be within the ordinary skill of a worker in the art to select a known material on the basis of its suitability for the intended use. Sinclair & Carroll Co. v. Interchemical Corp., 325 U.S. 327, 65 USPQ 297 (1945).

Allowable Subject Matter

34. Claims 7, 9 and 13-14 are objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

35. Claim 22 would be allowable if rewritten or amended to overcome the objections set forth in this Office action.

36. The following is a statement of reasons for the indication of allowable subject matter: Claim 7 contains allowable subject matter, since, as best understood, the prior art fails to teach or suggest an acousto-optic filter with a damper having two surfaces, each surface causing a back-reflection of the flexural wave, the back-reflections canceling one another out to negate the back-reflecting flexural wave as best understood as claimed.

37. Claim 9 contains allowable subject matter, since, as best understood, the prior art fails to teach or suggest the arrangement of Figure 4 where a mount for both a fiber and a damper has a groove, the damper being deposited over and around the fiber to be within the groove, the damper being longer in the base of the groove, as measured in the direction in which the wave travels in a base of the groove, than above the fiber.

38. Claim 13 contains allowable subject matter since the prior art fails to teach or suggest an acousto-optic filter damper surface having a varying slope. Claim 14 contains allowable subject matter by virtue of dependency and the understanding that intends to claim the material of Figure 4, although the objection still stands.

39. Claim 22 contains allowable subject matter since the prior art fails to teach or suggest the method of filtering light comprising the reflecting steps to cause a canceling step as claimed.

Conclusion

40. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure. Patent to Engan (US 5,022,732) is of interest for teaching damping methods utilizing a tapered element and a notched damping element (74). Patent to Baran (US 5,455,877) is of interest for teaching the use of partial absorbers in an acousto-optic device.

41. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Krystyna Suchecki whose telephone number is (703) 305-5424. The examiner can normally be reached on M-F 8-6, with alternating Fridays off.

42. If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Edward Glick can be reached on (703) 308-4858. The fax phone numbers for the organization where this application or proceeding is assigned are (703) 872-9318 for regular communications and (703) 872-9319 for After Final communications.

43. Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is (703) 305-4900.

ks
August 11, 2003

DAVID V. BRUCE
PRIMARY EXAMINER